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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

	Claude Couture, et al.	Art Unit:	1711
Application No.:	10/044,846	Examiner:	TRAN, Thao T.
Filed:	November 9, 2001	Docket No.:	CLWZ 2 00148

For: CROSSLINKED POLYSACCHARIDE, OBTAINED BY CROSSLINKING WITH SUBSTITUTED POLYETHYLENE GLYCOL, AS SUPERABSORBENT

MAIL STOP Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
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TRANSMITTAL OF
APPEAL BRIEF UNDER 37 C.F.R.§41.37

Dear Sir:

Applicant transmits herewith an APPEAL BRIEF UNDER 37 C.F.R.§41.37 for the above-reference patent application.

Payment in the amount of **$500.00** for the filing of this Appeal Brief is authorized to be charged to a Credit Card. The appropriate form PTO-2038 is enclosed for this purpose. If the Credit Card is unable to be charged, please charge any and all fees or credit any overpayment to Deposit Account No. 06-0308.

Respectfully submitted,

FAY, SHARPE, FAGAN,
MINNICH & MCKEE, LLP

Date: Oct 26, 2005

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Cathryn Terchek

Date October 26 2005

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Claude Couture, *et al.*
Serial No.	:	10/044,846
Filed	:	11/09/2001
Group Art Unit	:	1711
Examiner	:	Tran, Thao T.
Title	:	CROSSLINKED POLYSACCHARIDE, OBTAINED BY CROSSLINKING WITH SUBSTITUTED POLYETHYLENE GLYCOL, AS SUPERABSORBENT
Confirmation No.	:	7917
Last Office Action	:	July 15, 2005
Attorney Docket No.	:	CLWZ 2 00148

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APPEAL BRIEF UNDER 37 C.F.R. §41.37

Mail Stop Appeal Brief-Patents
Commissioner for Patents
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Alexandria, VA 22313-1450

Dear Sir:

This Appeal Brief is in furtherance of the Notice of Appeal and the Pre-Appeal Brief Request For Review that was mailed to the U.S. Patent and Trademark Office on August 17, 2005.

The fees required under 37 C.F.R. §41.20(b)(2) and any required petition for extension of time for filing this brief and fees therefor, are dealt with in the accompanying Transmittal of Appeal Brief.

Appellant files herewith an Appeal Brief in connection with the above-identified application wherein claims 4-9 and 66-82 were finally rejected in the Final Office Action of June 13, 2005.

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Cathryn Terchek

Date: October 26 2005

I. REAL PARTY IN INTEREST (37 C.F.R. §41.37(c)(1)(i))

The real parties in interest in this appeal are the inventors named in the caption of this brief (Claude Couture, David Bergeron and Frederic Picard) and the assignee of their interests, Lysac Group Inc.

II. RELATED APPEALS AND INTERFERENCES (37 C.F.R. §41.37(c)(1)(ii))

Currently, it is believed that there are no other appeals or interferences in process or pending before the U.S. Patent and Trademark Office which the present application bases its priority from, or any cases which base their priority upon the present application, that will directly affect, or will be directly affected by, or will have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS (37 C.F.R. §41.37(c)(1)(iii))

The status of the claims set forth after the Advisory Action mailed July 15, 2005 and the Notice of Panel Decision from Pre-Appeal Brief Review was, and is, as follows:

Allowed:	none
Rejected Claims:	4-9, 66-82

The present appeal is directed specifically to claims 4-9 and 66-82.

IV. STATUS OF THE AMENDMENT (37 C.F.R. §41.37(c)(1)(iv))

No amendments have been made that have not been entered by the Examiner.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER (37 C.F.R. §41.37(c)(1)(v))

The present claims are directed to a cross-linked polysaccharide(s), said cross-linked polysaccharide(s), being a polysaccharide cross-linked by a backbone chain of atoms, said backbone chain of atoms consisting of two terminal ether oxygen atoms, one or more intermediate oxygen link atoms and two or more intermediate alkylenes linking groups, each oxygen link atom being an ether oxygen atom. The backbone chain of atoms may thus be considered to have the formula:

Polysaccharide—O—alkylene—[—O—alkylene—]$_n$—O—Polysaccharide

wherein each alkylenes consisting of one or more unsubstituted CH_2 groups. Wherein n being the number of times that the intermediate alkylenes being repeated in the backbone chain of atoms. For instance, if n=1, n is repeated one time, the backbone chain of atoms comprises two alkylenes. "n" is an integer ranging from 1 to 100 (page 2, lines 20-24). Additional claims relate to specific embodiments of the above cross-linked polysaccharide.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL (37 C.F.R. §41.37(c)(1)(vi))

The Examiner has rejected claims 4-9 and 66-82 as being anticipated by U.S. Pat. No. 5,550,189 to Qin et al. ("Qin") under 35 § U.S.C. 102(b).

VII. ARGUMENTS (37 C.F.R. §41.37(c)(1)(vii))

Claims 4-6 and 66-82 have been rejected as being anticipated by Qin *et al.* (US Pat. 5,550,189) under 35 U.S.C. § 102(b). Appellants respectfully traverse the rejection as follows.

Qin *et al.* disclose a method for producing a water-swellable, generally water-insoluble modified polysaccharide (*i.e.* carboxyalkyl polysaccharide). The method comprises reacting a carboxyalkyl polysaccharide with a polyol cross-linking agent such as ethylene glycol and butylene glycol to provide cross-linked carboxyalkyl polysaccharides. Appellants respectfully submit that the use of such cross-linking agents inherently results in a polysaccharide which is cross-linked by a backbone chain of atoms comprising ester linkages. The present claims on the other hand, call for a backbone chain of atoms comprising ether linkages.

In the Advisory Action mailed on July 15, 2005, the Examiner failed to fully consider this argument among others presented by the Applicant in the "RESPONSE/REQUEST FOR RECONSIDERATION" mailed on June 21, 2005. More specifically, on page 3 of the "RESPONSE/REQUEST FOR RECONSIDERATION" it was pointed out by the Applicant that in the present

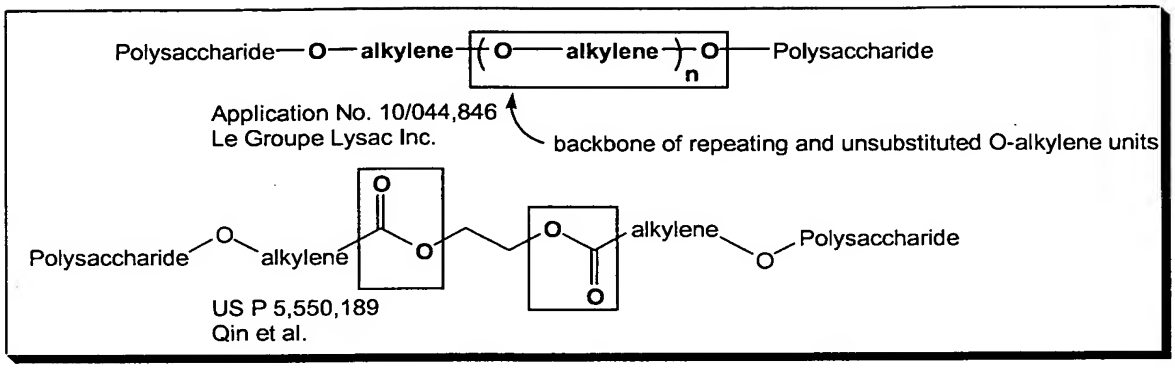
invention, "*The use of activated polyalkylene glycols to react with hydroxy groups on the polysaccharide results in a crosslinked backbone chain of atoms comprising repeating O-alkylene units, wherein the alkylene moieties are unsubstituted.*"

This argument has been made several times to the Examiner without the Examiner fully appreciating how this differentiates the present claims from Qin. Specifically, a similar argument was previously presented in the telephonic interview on June 17, 2005 in which it was stated that "*Qin teaches an alkylene glycol as a crosslinking agent, whereas the presently claimed invention utilizes a polyethylene glycol*". In addition, this argument was previously presented in the "RESPONSE/REQUEST FOR RECONSIDERATION" mailed March 18, 2005 in which the Applicant submitted that "*Qin et al. is silent about the use of activated polyalkylene glycols as cross-linking agents for polysaccharides. The use of such cross-linking agents results in a polysaccharide which is cross-linked by a backbone chain of atoms comprising repeating O-alkylene units, wherein the alkylene moiety is unsubstituted.*"

In each case, the Examiner failed to consider or simply chose to ignore that the present invention relates to a crosslinked polysaccharide comprising a **Poly**alkylene glycol crosslinking backbone, as opposed to an alkylene glycol crosslinking backbone as disclosed by Qin. This results in distinct structural differences between the compounds.

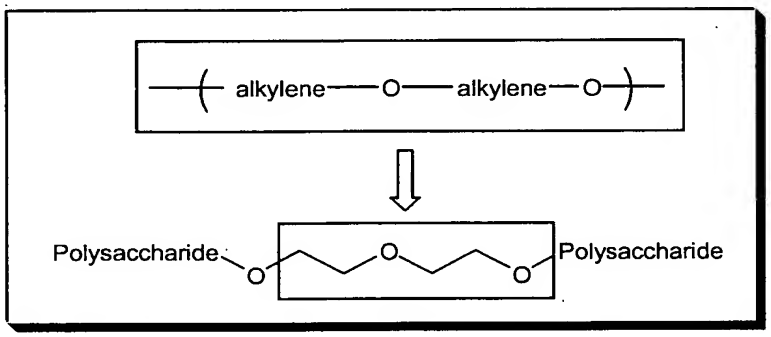
A. The Alkylene Units

First, in contrast to the teachings of Qin, the crosslinked polysaccharides of the present application are crosslinked by a backbone chain of atoms comprising repeating and unsubstituted O-alkylene units, wherein "n" is an integer ranging from 1 to 100, as shown in Scheme 1.



Scheme 1

In contrast to the teachings by Qin, wherein the polysaccharide is crosslinked by means of a pair of ester linkages, the crosslinked polysaccharides of the present application comprise repeating ether crosslinking units (see Scheme 1 above). The Applicant submits that, in the backbone chain of atoms of the present application, there is ALWAYS a static O-alkylene unit, in addition to a varying number of repeating O-alkylene units. Since "n" is an integer ranging from 1 to 100, the crosslinked polysaccharides of the present application comprise a crosslinker having at least two repeating O-alkylene units (illustrated below in Scheme 2 using an alkylene group being ethylene and "n" being 1).



Scheme 2

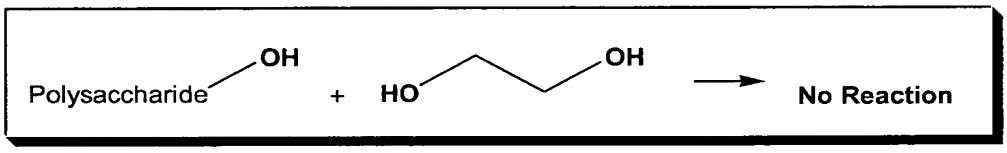
Further support for this distinction can be obtained from the wording of the present claims themselves. Specifically, the wording of claim 4 states "...*wherein **each** alkylene consists of...*". As the board will appreciate, the dictionary definition of the term "each", states that each denotes *"being one of two or more regarded individually"*. Webster's II New College Dictionary (1999). Thus, it is submitted that

the backbone chain of atoms, as recited in claim 4, denotes at least two alkylenes (two or more). The Qin reference contains only one alkylene.

B. The Reactivity of Starch

Second, in the Advisory Action mailed on July 15, 2005, the Examiner alleges that *"... the modified polysaccharide having unsubstituted OH groups would form ether linkages with the crosslinking agent"* (the crosslinking agent being ethylene glycol). Moreover, the Examiner alleges that *"since Qin also discloses the same polysaccharide, i.e. carboxymethyl starch, and the same crosslinking agent, i.e. ethylene glycol, as presently claimed, the product of Qin would inherently be the same"*.

The Applicant respectfully submits that even if the degree of substitution in the modified polysaccharides as disclosed by Qin is low, it is well known by those skilled in the relevant art that the free hydroxyl functions of starch do not readily react with ethylene glycol or with any other polyol. Moreover, the Applicant respectfully submits that it is well established in the relevant art that unactivated OH groups will neither react with one another, nor with ethylene glycol, nor with any other polyol to form ether linkages. That is:



Thus, the applicant respectfully submits that the Examiner's assertion above is incorrect based on an improper understanding of the chemistry involved and that Qin in fact teaches away from the crosslinked backbone chain of atoms as disclosed in the present application.

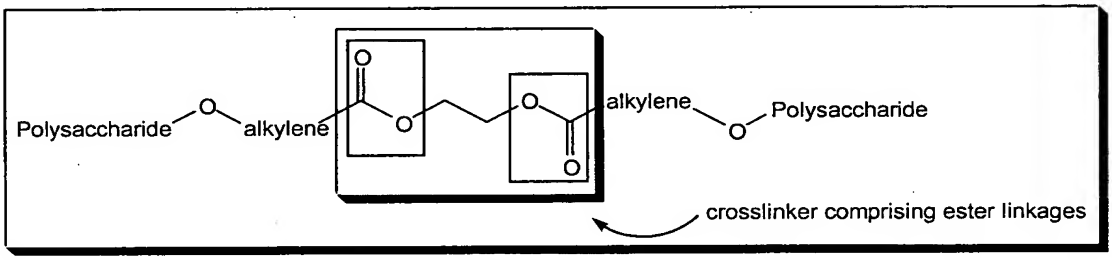
C. The Identity of the Crosslinking Agent

Third, in the Advisory Action mailed on July 15, 2005, the Examiner alleges that *"... since Qin also discloses the same carboxyalkyl polysaccharide, i.e. carboxymethyl starch, and the same crosslinking agent, i.e. ethylene glycol, as presently claimed, the product of Qin would inherently be the same."* The Applicant submits that contrary to the Examiner's allegation, the present invention does not

relate to crosslinked polysaccharides comprising a crosslinking backbone obtained by the use of a crosslinking agent such as ethylene glycol or butylene glycol. The Applicant respectfully submits that the crosslinking agents described in the present application are activated polyalkylene glycols (see, e.g., paragraph 0038 of the application).

The Applicant respectfully submits that the use of activated polyalkylene glycols as crosslinking agents has NOT been disclosed by Qin. Accordingly, contrary to the Examiner's allegation, none of the crosslinked polysaccharides as claimed in the presently pending application are disclosed by Qin. Moreover, the use of activated polyalkylene glycols as claimed in the presently pending application, inherently results in crosslinked polysaccharides that are structurally significantly different from those of Qin.

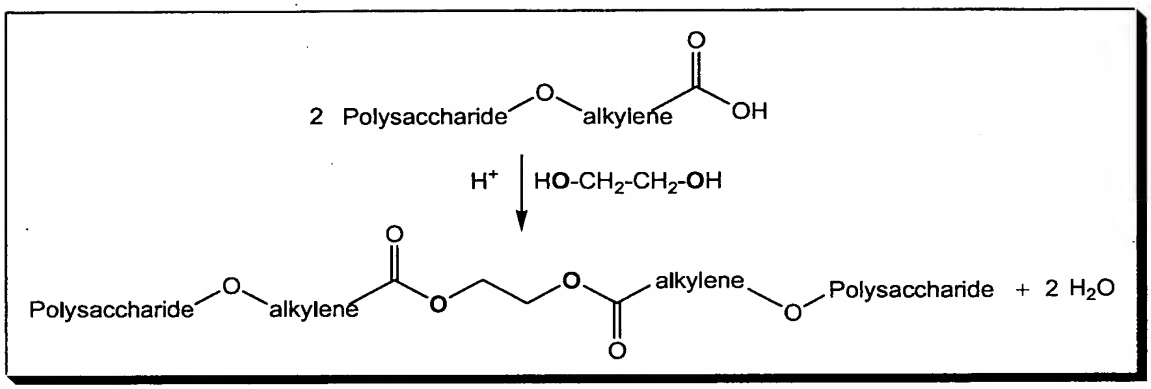
The Applicant submits that crosslinking of the carboxyalkyl polysaccharides as taught by Qin (exemplified by using ethylene glycol as the crosslinking agent), results in a reaction product having the structure as shown below in Scheme 3.



Scheme 3

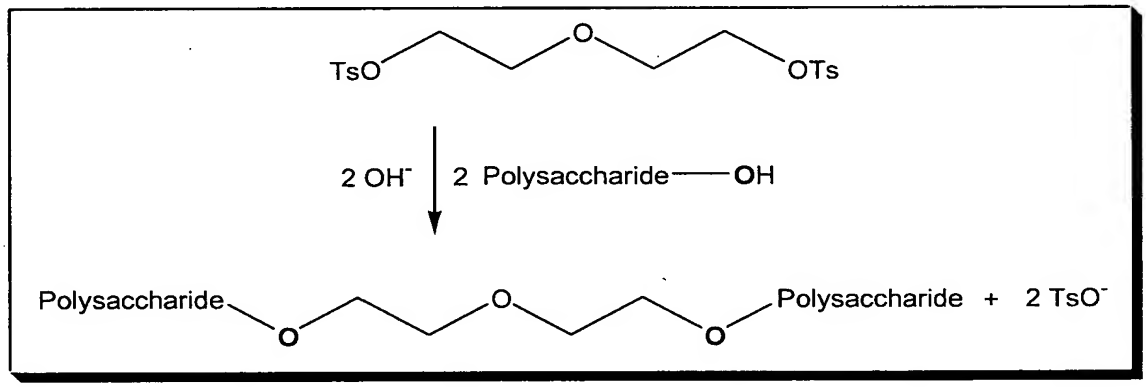
The crosslinking of carboxyalkyl polysaccharides as taught by Qin *et al.* using a polyol crosslinking agent (exemplified by the use ethylene glycol) inherently results in a polysaccharide which is crosslinked by a backbone chain of atoms comprising ester linkages (Scheme 3).

As disclosed by Qin *et al.* such crosslinked carboxyalkyl polysaccharides can typically be obtained by reacting a modified polysaccharide material with a crosslinking agent (exemplified using ethylene glycol) as illustrated below in Scheme 4.



Scheme 4

In contrast to the teachings by Qin and as mentioned above, the crosslinked polysaccharides of the present application are produced using activated polyalkylene glycols as illustrated below in Scheme 5, which illustrates the reaction process using an activated di-ethylene glycol (n = 1; X = Ts or tosylate). This embodiment is covered by claim 74 as presently pending.



Scheme 5

D. Summary

First, the Examiner failed to consider an essential argument based on the nature of the backbone chain of atoms crosslinking the polysaccharide. That is, the present invention relates to crosslinked polysaccharides comprising a crosslinker based on a **poly**alkylene glycol crosslinking backbone, as opposed to an alkylene glycol crosslinking backbone as disclosed by Qin.

Second, the Examiner rejected the claims of the present application based on chemically unfounded speculation that ethylene glycol or any other polyol

would react with the free hydroxyl (OH) functions of starch, even if the degree of substitution in the modified polysaccharides as disclosed by Qin is low. It is well known in the relevant art that free hydroxyl functions do not readily react with one another, or with ethylene glycol, or with any other unactivated polyol to form ether linkages.

Third, the Applicant submits that contrary to the Examiner's allegation, the present invention does not relate to crosslinked polysaccharides comprising a crosslinking backbone obtained by the use of a crosslinking agent such as ethylene glycol or butylene glycol or any other alkylene glycol. The Applicant respectfully submits that the crosslinking agents described in the present application are activated polyalkylene glycols.

CONCLUSION

In view of the above, Appellant respectfully submits that claims 4-9 and 66-82 are not anticipated or rendered obvious by the cited art.

Accordingly, it is respectfully requested that the Examiner's rejections be reversed.

Respectfully submitted,

FAY, SHARPE, FAGAN
MINNICH & McKEE, LLP

Dated: Oct 26, 2005

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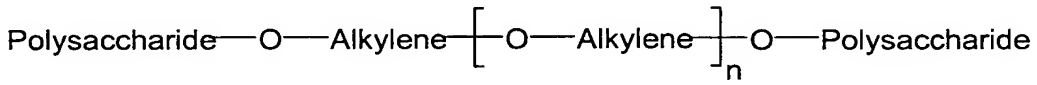
VIII. APPENDIX OF CLAIMS (37 C.F.R. §41.37(c)(1)(viii))

1. (Cancelled)

2. (Cancelled)

3. (Cancelled)

4. (Previously Presented) A cross-linked polysaccharide, said cross-linked polysaccharide being a polysaccharide cross-linked by a backbone chain of atoms, said backbone chain of atoms having the formula 2



2

wherein each Alkylene consists of one or more unsubstituted $-CH_2-$ groups, and wherein n is an integer ranging from 1 to 100.

5. (Original) A cross-linked polysaccharide as defined in claim 4 wherein n is 1, 2 or 3.

6. (Previously Presented) A cross-linked polysaccharide as defined in claim 4, wherein each Alkylene comprises from 1 to 5 $-CH_2-$ groups.

7. (Previously Presented) A cross-linked polysaccharide as defined in claim 6 wherein said alkylene is a $-CH_2-CH_2-$ group.

8. (Original) A cross-linked polysaccharide as defined in claim 7 wherein n is 1,2 or 3.

9. (Previously Presented) A cross-linked polysaccharide as defined in claim 4, wherein said backbone chain of atoms is a group of formula Polysaccharide-$O-CH_2-CH_2-O-$ CH_2-CH_2-O-Polysaccharide.

Claims 10-65 (cancelled).

66. (Previously Presented) A cross-linked polysaccharide as defined in claim 4, wherein the polysaccharide is

- a starch selected from the group consisting of starches derived from corn, wheat, rice, potato, tapioca, waxy maize, sorghum, sago and waxy sorghum;
- a modified starch selected from the group consisting of dextrinated, hydrolysed, oxidized, alkylated, hydroxyalkylated, acetylated and fractionated starches;
- a member selected from the group consisting of cellulose, dextrins, polygalactomannans, ionic and/or non ionic derivatized, chitin, chitosan, alginates, xanthan gum, carageenan gum, karaya gum, arabic gum, pectin and glass-like polysaccharides; or
- a member selected from the group consisting of an anionic and a cationic polysaccharide.

67. (Previously Presented) A cross-linked polysaccharide as defined in claim 66 wherein the anionic polysaccharides are substituted with anionic groups selected from the group consisting of dicarboxylate and tricarboxylate groups.

68. (Previously Presented) A cross-linked polysaccharide as defined in claim 66 wherein the anionic polysaccharides are substituted with anionic groups selected from the group consisting of iminodiacetate groups and citrate groups.

69. (Previously Presented) A mixture for use in a food pad; in sanitary napkins; in diapers; in incontinence products; in agricultural and forestry applications to retain water in soil and to release water to the roots of plants; in fire-fighting techniques; bandages and surgical pads; for cleanup of acidic or basic aqueous solutions spills, including water soluble chemicals spills and; as polymeric gels for cosmetics and pharmaceuticals also known as drug delivery systems and slow release substances; and for artificial snow, said mixture comprising a cross-linked polysaccharide as defined in claim 4 and one or more other known absorbents.

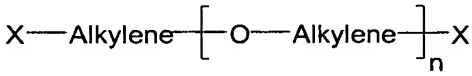
70. (Previously Presented) A cross-linked polysaccharide as defined in claim 66, wherein said anionic polysaccharide is an anionic starch.

71. (Previously Presented) A cross-linked polysaccharide as defined in claim 70, wherein said anionic starch is a carboxyalkyl starch, wherein the alkyl comprises from 1 to 3 carbon atoms.

72. (Previously Presented) A cross-linked polysaccharide as defined in claim 71, wherein said carboxyalkyl starch is a carboxymethyl starch.

73. (Previously Presented) A cross-linked polysaccharide as defined in claim 66, wherein said starch is a starch half ester selected from the group consisting of starch maleate half ester, starch succinate half ester, starch sulfosuccinate half ester, starch citraconate half ester, starch glutarate half ester and starch phthalate half ester.

74. (Previously Presented) A cross-linked polysaccharide as defined in claim 4, wherein said cross-linked polysaccharide is obtained by reacting a polysaccharide with an activated polyalkylene glycol having the formula 2a below:



2a

wherein each alkylene consists of one or more -CH_2- groups, wherein n is an integer ranging from 1 to 100, and wherein X is selected from the group consisting of halogen, mesylate, tosylate and triflate.

75. (Previously Presented) A cross-linked polysaccharide as defined in claim 74, wherein said halogen is selected from the group consisting of chloride, bromide and iodide.

76. (Previously Presented) A cross-linked polysaccharide as defined in claim 75, wherein said halogen is chloride.

77. (Previously Presented) A cross-linked polysaccharide as defined in claim 76, wherein said alkylene comprises from 1 to 5 $-CH_2-$ groups.

78. (Previously Presented) A cross-linked polysaccharide as defined in claim 77, wherein said alkylene is an ethylene group.

79. (Previously Presented) A cross-linked polysaccharide as defined in claim 78, wherein n is 1, 2 or 3.

80. (Previously Presented) A cross-linked polysaccharide as defined in claim 74, wherein said activated polyalkylene glycol has an average molecular weight of 10,000 or less.

81. (Previously Presented) A cross-linked polysaccharide as defined in claim 80, wherein said activated polyalkylene glycol has an average molecular weight of 300 or less.

82. (Previously Presented) A cross-linked polysaccharide as defined in claim 74, wherein said activated polyalkylene glycol is selected from the group consisting of 1,5-dichloro-3-oxopentane, 1,8-dichloro-3,6-dioxooctane and 1,11-dichloro-3,6,9-trioxoundecane.